

Agromedicine: One Medicine In Action

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NC STATE UNIVERSITY



Agromedicine Definition

- Broad, interdisciplinary
- Systematic and collaborative *partnership* of agricultural and medical professionals *to promote occupational and environmental health and safety* in agriculture through
 - *research,*
 - *prevention/intervention,*
 - *education and outreach.*



University of North
Carolina General
Administration

Director: Robin Tutor-Marcom, MPH, OTR/L

**North Carolina
State University**

**East Carolina
University**

**North Carolina
A&T State
University**

**Community and Agency
Partners**



Prevention/Intervention, Outreach, and Education

1. *Understanding the Agricultural Health Study*
2. Pesticide Related Illness & Health Issues (CE Course)
3. *Pesticides and Human Health Toolkit*
4. AgriSafe of NC and Certified Safe Farm
5. Risk Mitigation Measures
6. *Agricultural Medicine: Occupational and Environmental Health for Rural Health Professionals* (CE Course)



Agricultural Health Study

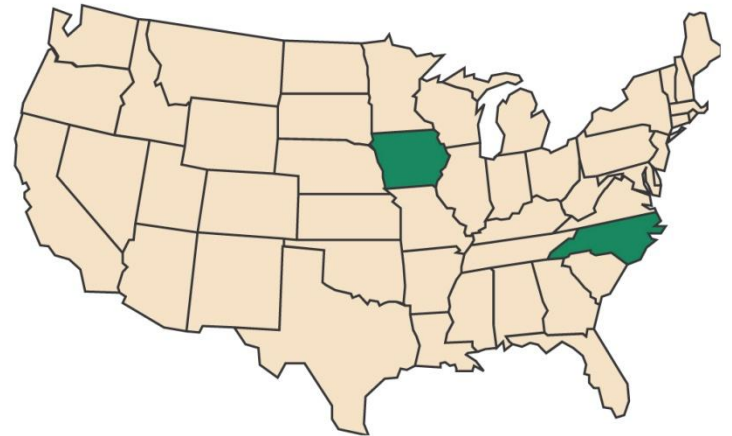
- A prospective epidemiology study of 90,000 pesticide applicators & spouses in Iowa and North Carolina
- Designed to assess a wide range of health effects of agricultural exposures in farmers and their families
- Conducted by scientists from:
 - National Cancer Institute (NCI)
 - National Institute of Environmental Health Sciences (NIEHS)
 - US Environmental Protection Agency (USEPA)
 - National Institute for Occupational Safety and Health (NIOSH)
 - Collaborators from academic and private research organizations



Agricultural Health Study

Participants

- Certified pesticide applicators and farmers' spouses (89,658)
 - North Carolina:
 - Farmers (20,518)
 - Spouses (10,576)
 - Iowa:
 - Farmers (31,877)
 - Spouses (21,771)
 - Commercial applicators (4,916)
- Enrollment: 1993 - 1997





Agricultural Health Study

- Questionnaires (follow-up every 5 years):
 - Demographics
 - Diet and lifestyle factors
 - Medical history
 - Pesticide use, other agricultural exposures and practices
- Linkages to cancer, vital statistic, renal disease registries
- Pesticide exposure estimates validated through field monitoring
- Biological samples (cheek cells) collected for DNA
- Targeted sub-studies
 - collect additional exposure and clinical measures
 - investigate gene-environment interactions and disease mechanisms



Agricultural Health Study Timeline



1993-1997	Recruit, survey participants
1998-2003	Field test pesticide exposure estimates; collect genetic sample
2004-2008	Assess disease rates, risk factors
2009-2013	Evaluate disease mechanisms
2013-	Continue risk & mechanism studies



Some Pesticide Exposure Findings

14% reported at least one
“High Pesticide Exposure Event”



7% reported having sought medical care
for pesticide exposure



Use of chemically-resistant gloves
increased over a 10 year period (21-46%)





Some Cancer Findings

- Prostate cancer incidence higher among male applicators
- Skin melanoma incidence higher among female spouses
- Pesticides associated with increased cancer risk:
 - Alachlor: all lymphohematopoietic
 - Carbaryl: melanoma
 - Metolachlor: lung
 - Pendimethalin: lung, pancreas, rectal
 - Permethrin: myeloma
 - Trifluralin: colon
- Monoclonal gammopathy of undetermined significance (MGUS) prevalence 1.9x higher in male pesticide applicators compared to MN men
- Cancer among Livestock and Poultry Farmers
 - Raising poultry associated with lower risk of developing lung cancer
 - Raising poultry associated with increased risk of colon cancer, non-Hodgkin's lymphoma
 - Raising sheep associated with increased risk of multiple myeloma
 - Performing veterinary services associated with increased risk of Hodgkin's lymphoma



Some Respiratory Findings

- Pesticides: independent risk factors for wheeze, asthma
- Pesticides: associated with allergic (but not non-allergic) asthma among women and men
- Lifetime pesticide use: associated with chronic bronchitis among non-smoking farm women
- High pesticide exposure events: contribute to asthma and chronic bronchitis risk.
- Lung Health Study (ongoing) is collecting:
 - Clinical measures: asthma, other respiratory outcomes, allergy
 - Environmental measures: endotoxin, other biological agents



Agricultural Health Study

Outcomes of Interest

- Autoimmune
- Cancer
- Cardiovascular
- Cause of mortality
- Neurological
- Renal
- Reproductive
- Respiratory
- Thyroid

~180 publications

<http://aghealth.nih.gov/>

Understanding the Agricultural Health Study



- **For all audiences:**
Illustrated Publication Series
(75,000 distributed in 10 states)
 - 1-Overview
 - 2-Pesticide Exposure
 - 3-Health Findings
- **For Farmers: (21,000)**
PowerPoint Presentation
included in 2006-2008
NC Private Pesticide Applicator
Recertification Curriculum
- **For Rural Health Providers:**
Continuing Education Course



- Course content meets *National Pesticide Practice Skills Guidelines for Medical and Nursing Practice*
 - Recognition and Management of Pesticide Poisonings
 - Latest Scientific Findings in Chronic Health Effects
 - Case Studies
- Currently under revision; series of 1-hour modules
- <http://www.aheconnect.com/newahec/courses.asp>

the Brody School of Medicine
at East Carolina University



Pesticides and Farmworker Health Toolkit

Apples

Bell Peppers

Blueberries

Christmas Trees

Cucumbers

Grapes

Landscape/Turf

Strawberries

Sweetpotatoes

Tobacco

Tomatoes



<http://go.ncsu.edu/pesticide-toolkit>

Kelley Donham, DVM, MPH

Agricultural Medicine

- Developed consensus curriculum for Agricultural Medicine course
- Research in lung health of hog confinement farmers and workers
- Commitment to agricultural community



Certified Safe Farm & AgriSafe

- On-Farm Safety Reviews
- Occupational Health Services by an **AgriSafe** Provider
- Education
- Incentives





Occupational and Wellness Health Screenings

PPE Technical Assistance





Research to Practice: Adapting & Implementing Iowa's Model in **North Carolina**



Certified Safe Farm  **of North Carolina**



**NORTH CAROLINA
AGROMEDICINE INSTITUTE**
Partners for Health and Safety in
Agriculture, Forestry, and Fisheries
East Carolina University • NC State University • North Carolina A&T State University



AgriSafe
Network
of North Carolina



NC State University
A&T State University
**COOPERATIVE
EXTENSION**
Empowering People • Providing Solutions

**Promoting *Certified Safe Farms* in North Carolina
through AgriSafe health services, on-farm safety reviews and
education and outreach to farm families.
Funded through the NC Tobacco Trust Fund Commission.**



North Carolina

Tobacco Trust Fund Commission

3-year Pilot Results

Johnston, Duplin, Sampson counties

- Outreach, Awareness, or Education 18,612
 - Certified Safe Farm Reviews 120
 - Gold Star Certified Safe Farms 48 (40%)
(comprehensive AgriSafe health review)
 - Farms with Approved Cost-Share 38 (32%)
 - Average Cost-Share Payment \$3,000
- AgriSafe Health Screenings (47 counties) 3800
 - Health screenings with referrals 500



Sampson County Farm Cost-Share Pesticide Safety Improvements



Before



After

Risk Mitigation Measures Project



NC STATE UNIVERSITY



2010

- Soil fumigant workgroup
- Strategies to assist farmers with implementation of EPA risk mitigation measures (RMM)
- Additional funding from NC Tobacco Trust Fund

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SATURDAY, March 12, 2011

The Daily Reflector

LOCAL & STATE

Farmers receive respirators to comply with EPA

BY K.J. WILLIAMS

The Daily Reflector

Tobacco growers are getting ready to prepare their fields for planting, and this year that means getting themselves ready with fittings for respirators.

A change to the labeling used on some fumigants has farmers lining up for fittings for the full-face respirators, now necessary for growers if they experience any eye irritation while wearing a half-mask. The new Environmental Protection Agency requirement took effect Dec. 31.

James Corbett, 48, has farmed his whole life in Edgecombe County.

After passing the test on Friday at the Pitt County Agricultural Center, he was handed a respira-

tor.

"This is your safety; the same thing as firefighters," he said. "It used to be like seatbelts. It was your choice. Now it's required."

Corbett likely will only use the mask occasionally when he fumigates his tobacco fields, he said. He also grows row crops.

Fittings continue today starting at 8 a.m.

George Elderbaum is providing the testing as a contractor for the N.C. Agromedicine Institute, an organization that's a partner-

ship between East Carolina University, N.C. State University and N.C. Agricultural & Technical State University.

"Every face is a little different," he said while testing the fit on the respirator worn by Beaufort County lifelong farmer Jimmy Hardison.

Using an analyzer machine with tubes hooked into Hardison's mask, Elderbaum took readings while giving Hardison in-

"It (wearing a respirator) used to be like seatbelts. It was your choice. Now it's required."

James Corbett

farmer in Edgecombe County

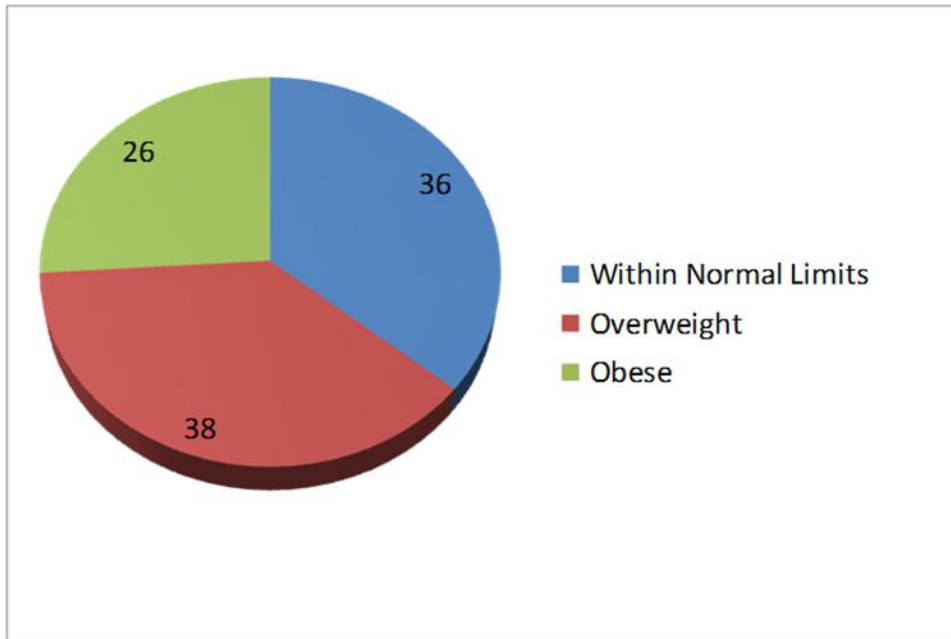


RHETT BUTLER/THE DAILY REFLECTOR

ERNEST WINTSTEAD tries on a respirator mask during a fitting session at the Cooperative Extension Service on Friday.

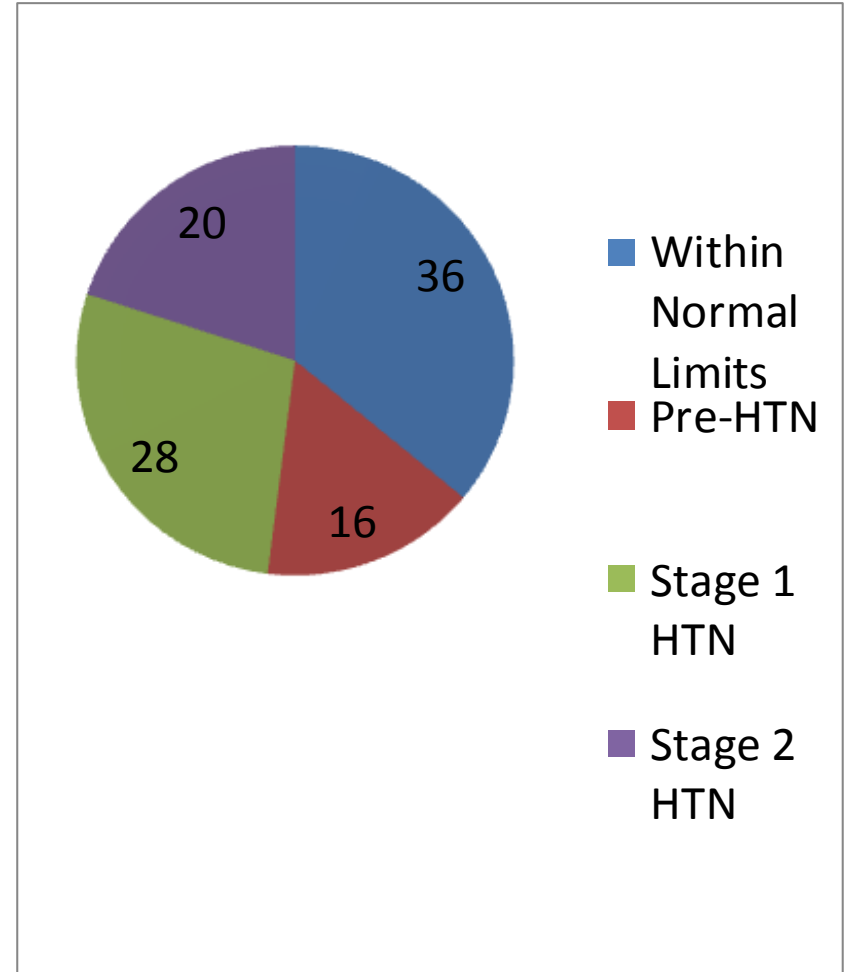
See FARMERS, B3

Overweight/Obese

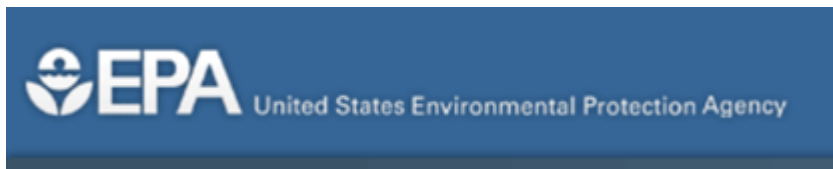


Percentage of individuals with weight and blood pressure concerns 1st Quarter 2011

Hypertensive



Informing EPA Policy Implementation



Risk Mitigation Measures II

DIY Training: Respirator Fit Test

- Fit Tests Required Annually
- Registration \$75.00 (~~\$150~~)
- Fit test kit \$99.31 (~~\$353~~)
- Earn 3.5 hours pesticide credit (A B G H I K L M N O T D X)
- Upcoming 2014 Dates:
 - January 14: Franklin County Extension
 - January 22 and 29: TBD
 - February 5 and 19: TBD
 - March 11 and 16: TBD
 - April 2 and 8: TBD
- **Contact Barbara Gallagher, RN
AgriSafe Nurse Coordinator
717-873-5656; gallagherb@ecu.edu**



Agricultural Medicine: Occupational and Environmental Health for Rural Health Professionals

- Session I:
January 30-31, 2014
Greenville, NC
- Sessions II-VII:
February – March,
2014
Via the web
- Session VIII:
March 27-28, 2014
Greenville, NC



ECU Continuing Studies: **252.328.9198, 800.767.9111**



NIOSH

NC Farm Bureau



Acknowledgements



Get involved in Agromedicine!



NC Agromedicine Institute

252.744.1008

www.ncagromedicine.org

